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Namens onze Vereniging betuigen wij onze hartelijke deelneming aan zijn dochter en zoon. — B. J. LEMPKE.

The characters of *Cyobius wallacei* Sharp, a little-known onthophagine scarab from the Malay Archipelago (Coleoptera: Scarabaeidae)¹

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With 17 text-figures

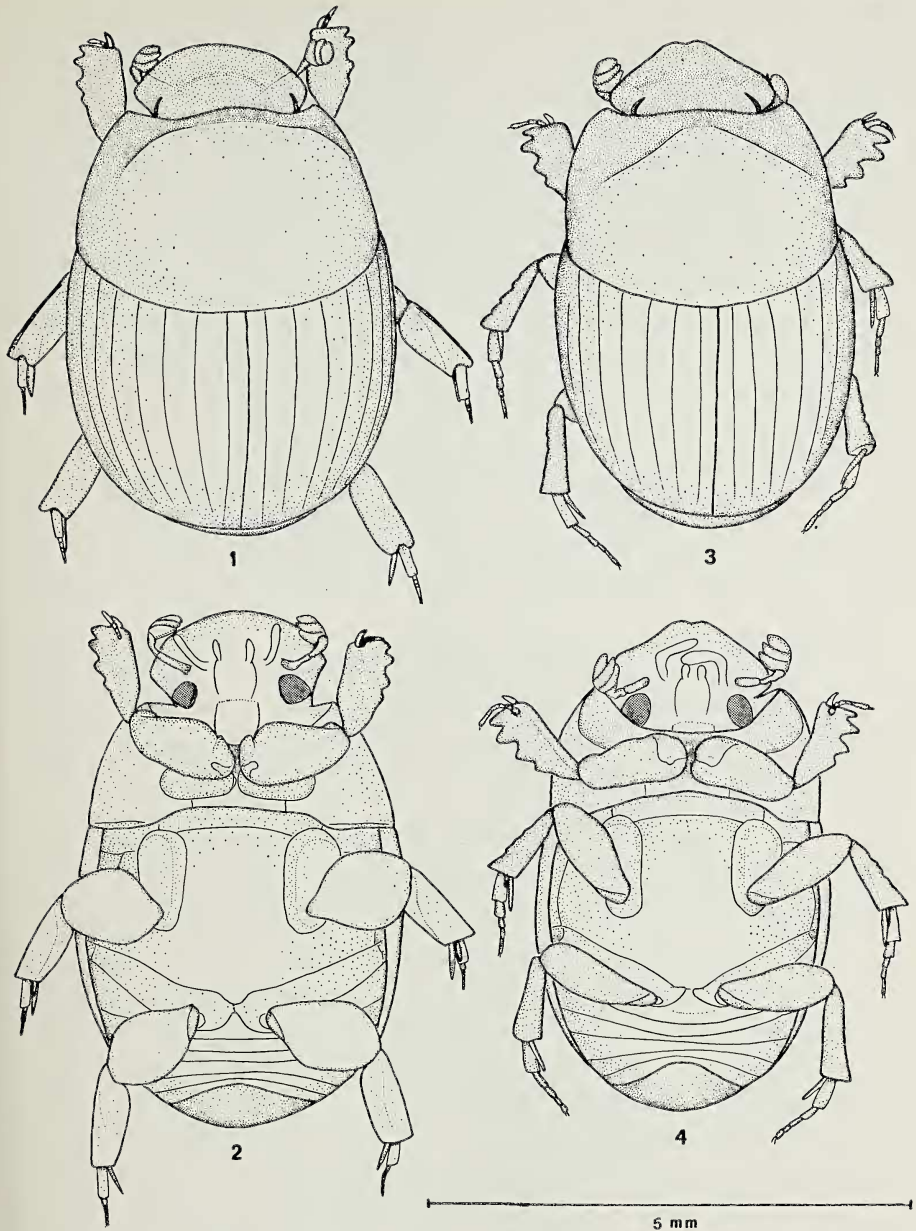
ABSTRACT

Two-segmented middle and hind tarsi have always been considered to be an outstanding character of *Cyobius wallacei* Sharp, here reported from Borneo, Java, Sumatra and the Batu Islands. It is pointed out that this single known species of the genus *Cyobius* Sharp is similar to representatives of allied genera in having the usual maximum of five tarsal segments. A discussion of errors and problems concerning *Cyobius* and certain species of the closely allied genus *Anoctus* Sharp is followed by a revised generic diagnosis of *Cyobius*, supplemented with notes on less important characters.

In the Leiden museum I found two peculiar unidentified scarab beetles from Sumatra collected about 70 years ago by M. KNAPPERT, an industrious correspondent of the Dutch coleopterist H. J. VETH. The identification of these scarabs proved to be an arduous task: although undoubtedly referable to the tribe Onthophagini, six genera of which are represented in Asia and two in Australia, they did not perfectly satisfy the diagnoses of these genera. Nevertheless, the extreme dilatation of femora and tibiae in the two problematic Onthophagini was strongly reminiscent of one of these genera, viz. *Cyobius*, proposed nearly a hundred years ago by D. SHARP (1875). The genus *Cyobius* still includes but a single known species, *C. wallacei* Sharp, described from a unique specimen collected by the renown A. R. WALLACE in Sarawak. All the diagnostic observations on *Cyobius* (references see below) include as a primary feature of the genus the aberrant two-segmented tarsi, whilst the Sumatran beetles before me, and some very similar specimens acquired later, had in a complete state five tarsal segments in fore, middle and hind legs (some segments apparently broken off asymmetrically).

BALTHASAR in his recent monograph (1963b: 152) already considered certain statements on the build of the tarsi unreliable; nevertheless, in his key to the genera of Palearctic and Oriental Onthophagini (BALTHASAR, 1963b: 112) mentioned as a main character of *Cyobius* the presence of only two tarsal segments, against the usual five in other genera. BALTHASAR's doubts as to the reliability of infor-

¹) Part of a paper read before the Netherlands Entomological Society, Amsterdam, April 26, 1970.



Figs. 1-2, *Cyobius wallacei* Sharp, male from Tanahmasa; 1, dorsal and 2, ventral aspect.
 Figs. 3-4, *Anoctus laevis* Sharp, male from Pengalengan, West Java; 3, dorsal and 4, ventral aspect. (Pilosity and sculpture omitted.)

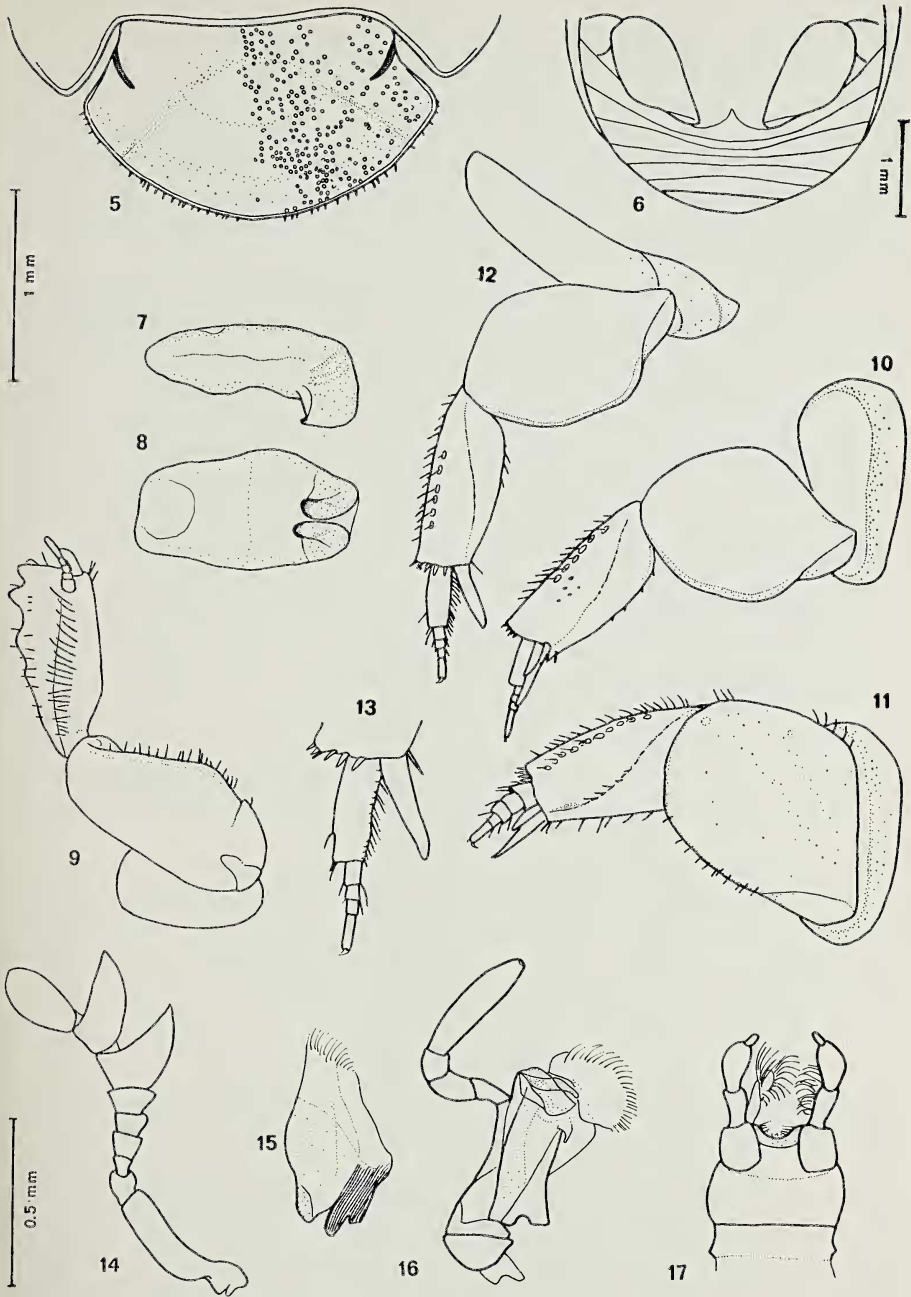
mation concerning the tarsal structure in *Cyobius* were initiated by some remarks in a review of the Malayan *Laparosticti* by BOUCOMONT (1914: 327). On *Cyobius* BOUCOMONT wrote: "Tarses à dense articles, le premier plus grand. . .", whereas in the paragraph preceding this observation it is read:" Il existe plusieurs autres espèces inédites sur le continent asiatique appartenant à ce groupe [d'*Onthophagus scatonomoides*]. Je possède un individu de l'île Banguey [see further below] qui ressemble à *Cyobius Wallacei* Sharp dont j'ai vu un exemplaire dans la collection de Gênes, il n'en diffère que par les caractères génériques; la ressemblance est telle qu'on se demande si l'on n'est pas en présence des deux sexes d'une même espèce" (BOUCOMONT, 1914: 327). The specimen in the Genoa museum is presumably the one mentioned earlier by HAROLD (1877: 42), who concluded his notes on *Cyobius* with the remark that "ses tarses postérieurs... ne sont composés que de deux articles". PAULIAN (1945: 61) merely repeated BOUCOMONT's observation on *Cyobius*.

SHARP's original diagnosis reads: "Tibiae anticae apice truncatae, latae, extus leviter tridentatae, tarsi graciles, articulis 5... Pedes 4 postici abbreviati, femoribus latissimis, fere circularibus; tibiae nudaе, laminatae, apice subangustatae, intermediae apice calcaribus duobus, posteriores unico; tarsis biarticulatis, articula basali sat magno . . . Genus tarsorum structura perinsigne, ex affinitate Caccobii" (SHARP, 1875: 48).

All in all, I suspected several tarsal segments to be lost in SHARP's specimen, and possibly also in others seen by later workers. My suspicion was confirmed during a visit to the Paris museum where I found the type of *Cyobius wallacei* in the R. OBERTHÜR collection. As BALTHASAR (1963b: 152) rightly observed, the connections of *Cyobius* with the allied genus *Anoctus* Sharp (1875: 49) consequently need some clarification.

Until now five species from tropical Asia have been assigned to *Anoctus*. I have seen representatives of all these species (if the synonymy of *Anoctus siamensis* Balthasar, 1942: 199, and *A. foveolatus* Paulian, 1945: 61, is correct), and there is no marked deviation from the type-species *Anoctus laevis* Sharp (1875: 49), the type of which, a female, was also found in the OBERTHÜR collection. Accordingly, it would be formally and practically sufficient to compare *Cyobius wallacei* with *Anoctus laevis* (see figs. 1—4, generic diagnosis and discussion of affinities of *Cyobius*). However, a little problem complicates the matter.

Onthophagus scatonomoides Lansberge (1885: 386) is said to be identical with *Anoctus laevis* (ARROW, 1931: 138); ARROW did not indicate a sex as was suggested by BALTHASAR (1963b: 149), who listed *scatonomoides* as a separate species of *Anoctus*. Unfortunately, the type of *Onthophagus scatonomoides* has disappeared; BOUCOMONT wrote (1914: 327): "J'ai vu le type dans la collection du Musée de Gênes", but it could not be found there in 1969. Therefore, I cannot definitely confirm the specific identity of these beetles, though I agree with ARROW and BALTHASAR that *Onth. scatonomoides* should be assigned to *Anoctus*. The only consequence of this uncertainty is that the drawings of the male (figs. 3-4) tentatively identified as *Anoctus laevis* may pertain to *A. scatonomoides* (Lansb.). I am confident that this will not affect the delimitation of *Cyobius*, which is the main purpose here.



Figs. 5-17, *Cyobius wallacei* Sharp; 5,9-10, 12-13, male from Tanahmasa; 6, female from Kampong Kuap; 7-8, 14-17, male from Manna; 11, male from Pontianak. 5, Head, dorso-frontal aspect. 6, venter of female to show arrangement of sternites. 7, phallus, lateral aspect and 8, ventral aspect. 9-13, legs, ventral aspect; 9, fore leg; 10-11, middle legs; 12, hind leg; 13, apical portion of the same leg, enlarged. 14, right antenna, ventral aspect. 15-17, mouth-parts, ventral aspect; 15, mandible; 16, maxilla; 17, labium.

The beetle alluded to by BOUCOMONT (1914: 327) as being very similar to *Cyobius wallacei* was later named *Onthophagus cyobioides* Boucomont (1921:91), which reportedly has the fore tibiae not transversely truncate; in the original description other useful details are lacking, and I have been unable to study the type. As in the case of *Onth. scatonomoides* I think that the identity of *Onth. cyobioides* is not very relevant here. Perhaps this beetle should also be assigned to *Anoctus*; at any rate, I can hardly believe it to be some *Cyobius*, since before me are two specimens of *Cyobius wallacei* with five-segmented tarsi correctly identified by BOUCOMONT (in 1924 and 1925).

Compared with Onthophagini, *Anoctus* and especially *Cyobius* are remarkably globular, lacking the constriction behind the prothorax, and the head and pronotum being devoid of projecting elevations; folded tibiae of *Cyobius* are covered by the strongly expanded femora. These features may be related with their habits. *Anoctus myrmecophilus* (Arrow) from South India "was found in some numbers in a nest of the harvesting ant (*Phidologiton diversus*) in a decaying Ficus trunk" (ARROW, 1931: 139). BALTHASAR is not consistent as to his statements on myrmecophily in *Anoctus*. In the first volume of his monograph (BALTHASAR, 1963a:61), besides a reference to ANDREWES's observation, the ant *Acromyrmex* is said to be the host of *A. siamensis* Balth., and *A. laevis* Sharp is listed merely as being myrmecophilous. However, in the second volume (BALTHASAR, 1963b:148) he wrote: "Bei einer der Arten (*A. myrmecophilus* Arr.) wurde die Myrmekophilie bewiesen und sie kann daher auch bei den übrigen Arten angenommen werden". *Acromyrmex* happens to be a strictly American genus of fungus-growing ants; it is not listed by CHAPMAN & CAPCO (1951; see also HALFFTER & MATTHEWS, 1966: 55). Even if some Asian *Acropyga* was meant the inconsistency remains. *Cyobius* has not been recorded from ants' nests, but its loricate build strongly suggests that it does inhabit such critical places.

For the loan of specimens I am indebted to the authorities of three institutions: British Museum (Natural History), London; Muséum National d'Histoire Naturelle, Paris; Instituut voor Taxonomische Zoölogie, Universiteit van Amsterdam. The authorities of the Museo Civico di Storia Naturale "G. Doria", Genoa, kindly assisted in the search for the type of *Onthophagus scatonomoides* Lansb.

Genus *Cyobius* Sharp

Cyobius Sharp, 1875, Col. Hefte 13: 48 (single sp. *C. wallacei* Sharp). HAROLD, 1877: 42. BOUCOMONT, 1914: 327. BALTHASAR, 1963b: 112 (in key), 152.

Generic diagnosis. — Middle and hind femora strongly flattened, strikingly dilated, subelliptic or subcircular in outline (length/width ratio not exceeding 1.5). Tibiae strongly flattened and dilated, shorter than respective femora; tibial apices transversely truncate; distal portions of inner and outer edges in middle and hind tibiae not diverging distad, simply linear, even lacking traces of fossorial carinae; fore tibia with only two or three teeth externally; tibial spurs well-developed, two in the middle tibiae, one in the others. Tarsi five-segmented, remarkably short, middle and hind tarsi about half as long as respective tibiae; segments 2—4 very short; claws of middle and hind tarsi minute.

General form of *Cyobius* notably semiglobular; well-defined elevations absent; clypeal border circular, without incisions; genae distinctly angular; dorsally visible portions of eyes narrowly lunulate. Postocular cavities of prosternum well-marked. Elytra with 7 striae; epipleura wide and acutely inflexed; scutellum not visible. Abdomen with 6 visible sternites and exposed pygidium. Antenna nine-segmented, with club 3-lamellate. Maxillary palpus well-developed, four-segmented; labial palpus three-segmented, apical segment reduced. Sexual dimorphism primarily evident in the more (male) or less (female) compact arrangement of the abdominal segments.

Type-species: *Cyobius wallacei* Sharp, by monotypy.

Affinities. — *Cyobius* is extremely similar to *Anoctus* Sharp, except for the build of the legs. In *Anoctus* the tibiae are subtriangular, the tarsi are not remarkably shortened and the femora not expanded. Antennae, mouthparts and phallus of *Anoctus leavis* Sharp almost duplicate those of *Cyobius wallacei*. *Caccobius* Thomson is not essentially different from *Cyobius* and *Anoctus*, as SHARP already noticed ("ex affinitate Caccobii"); but *Caccobius* lacks the collinearity in its outline, the legs are of the normal onthophagine type, i.e. elongately subtriangular with fossorial elevations, and many species have well-defined cephalic and/or pronotal prominences. It can hardly be doubted that *Caccobius*, *Anoctus* and *Cyobius* represent stages in a series from generalized Onthophagini to specialized loricata types. The interrelations of these genera and their systematic positions in the tribe need to be reconsidered in case more material becomes available.

Distribution. — The single known species of *Cyobius* is recorded from a small number of lowland localities in western Malaysia. Among the Scarabaeidae sensu stricto *Cyobius* is the only genus peculiar to this part of tropical Asia.

Cyobius wallacei Sharp (figs. 1-2, 5-17)

Cyobius wallacei Sharp, 1875, Col. Hefte 13: 49 (type-loc. "Sarawak"). HAROLD, 1877: 42. BOUCOMONT, 1914: 327. BALTHASAR, 1963b: 153.

Descriptive notes. — The following notes are supplementary to the above generic diagnosis and the illustrations. Approximate length 4.5—5.5, width 3—3.5, height 2 mm. Colour brownish red, very shiny.

Head with numerous fine punctures, interspaces exceeding punctural diameters. Pronotum densely punctate; punctures small, shallow, well-defined, very evenly distributed, interspaces exceeding punctural diameters; lateral borders of pronotum finely marginate; pronotum of both males (except one specimen, see below) and females with shallow anterior-lateral impressions topped by curvilinear crest.

Elytral striae and their punctures shallowly impressed but well-defined; striae punctures regularly spaced, separated by a few times their diameters, slightly affecting interstriae surfaces. Elytral interstriae flat, finely, more or less sparsely punctate, and correspondingly pubescent in most specimens; marginal gutter of elytra narrow. Epipleura densely covered with distinct, shallow, bristle-bearing punctures.

Sternal elements with small, shallow, well-defined punctures; punctuation lacking

on discal portions of metasternum (or nearly so), dense on metasternal wings as on other sternal surfaces, locally bristle-bearing. Sternites with distinct transverse series of fine punctures. Pygidium not distinctly marginate at base; surface minutely, inconspicuously punctate.

A male from Pontianak is very interesting by having the characters of the legs (dilatation and abbreviation) more strongly pronounced than other specimens, as may be apparent from a comparison of figs. 10 and 11. There are other differences such as the absence of the anterior-lateral impressions of the pronotal surface, the presence of only two distinct teeth in the fore tibiae, and the slightly different phallus. Among the forms in the above-mentioned series *Caccobius*—*Anoctus*—*Cyobius* this specimen from Pontianak is a climax. It may represent a separate taxon but for the time being I refrain from naming it.

Material examined. — 5 males, 2 females.

Holotype, female, bearing three labels with the following data: "Sar[awak] Wallace", "Cyobius wallacei Type D.S.", "Ex Musaeo D. Sharp 1890" (Paris).

Java. — Nusa Kambangan, X.1911, leg. F. C. DRESCHER (1 ♂, Amsterdam).

Borneo. — Sarawak: Kampong Kuap [approximate location: 1° 25'N—110° 22'E; labelled "Quop"], 18.IV.1914, leg. G. E. BRYANT (1 ♀, London, det. BOUCOMONT 1925); type, see above. Kalimantan Barat: Pontianak, leg. F. MUIR (1 ♂, London, ex. coll. D. SHARP).

Sumatra. — Manna, leg. M. KNAPPERT (2 ♂, Leiden); Batu Islands: Tanahmusa, 1896, leg. I. Z. KANNEGIETER (1 ♂, Paris, det. BOUCOMONT 1924).

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